

REMARKS

Claims 1-22 are all the claims presently pending in the application.

It is noted that the claim amendments are made only for more particularly pointing out the invention, and not for distinguishing the invention over the prior art, narrowing the claims or for any statutory requirements of patentability. Further, Applicant specifically states that no amendment to any claim herein should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the amended claim.

Claims 1-22 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Belkhale, et al. ("Timing analysis with known false sub graphs," Computer-Aided Design, 1995. ICCAD-95. Digest of Technical Papers, 1995 IEEE/ACM International Conference on, 5-9 Nov. 1995, Page(s): 736-739).

This rejection is respectfully traversed in the following discussion.

I. THE CLAIMED INVENTION

The claimed invention is directed to a method for performing an analysis of a network composed of at least one path. A composite graph having $K + 1$ copies of an original graph is generated, where the original graph represents the network with zero defects and K is a predetermined maximum number of defects on any of the at least one path. An analysis of the network is performed using the composite graph.

Conventional systems do not provide a method to analyze timing for logic networks in which defects or faults causing shifts in circuit delays are taken into account.

The claimed invention, on the other hand, by using making a composite timing graph composed of $K+1$ copies of the normal timing graph provides a new method and a new analysis tool so that even manufacturing abnormalities not serious enough to cause a hard failure can be analyzed.

II. THE PRIOR ART REJECTION

The Examiner alleges that Belkhale teaches the claimed invention. Applicant is quite familiar with the work described in this article, having personally worked with the authors,

Belkhale and Suess, at IBM. Applicant submits, therefore, that there are a number of distinct differences in both the purpose and the method.

First, although Belkhale computes multiple arrival times (ATs) and required arrival times (RATs) on each node of the timing graph, it does not compute separate delays on the edges of the timing graph. Thus, the multiple timing values stored on each node do not constitute copies of the original timing graph, as this term would be understood by one of ordinary skill in the art.

It is also pointed out that the "false sub graphs" of Belkhale, which the Examiner seems to be equivalent to "copies" of the present invention, is defined in Belkhale as "sub graphs of G" (see, e.g., the penultimate paragraph in column 2 of page 736, and Figure 1 clearly shows that the false sub graphs are not copies of graph G. Therefore, Applicant submits that Belkhale itself defines false sub graphs as not being a copy of graph G.

It is also noted that, although an Examiner is expected to make the broadest reasonable interpretation of claim language, according to MPEP §2111, the interpretation must also be consistent with the interpretation that those skilled in the art would reach.

For this reason alone, the present invention is distinguished from Belkhale.

Hence, turning to the clear language of the claims, in Belkhale there is no teaching or suggestion of: "... generating a composite graph comprising $K + 1$ copies of an original graph", as required by independent claim 1. All of the independent claims have corresponding language.

Second, it is noted that the multiple "copies" of timing information stored on each node by Belkhale do not constitute defects in the sense described in the present invention. More specifically, the multiple timing values in Belkhale relate to different paths which were taken through the timing graph, distinguished by the set of false paths to which they may contribute.

In contrast, in the present invention, defects are defined at lines 4-6 of page 16: "... any delay shift is loosely called a "defect" or "fault", even though the source of the shift is not necessarily a defect in the normal sense". The term "defect" in the claims of the present invention should be understood in the context of this definition.

Third, while Belkhale distinguishes between edges which are in a false path graph and those which are not, the method therein does not compute different delays for these edges based on these distinctions. Therefore, Belkhale does not compute a delay for distinguished defect edges based on the presence of a type of defect in a network.

Fourth, regarding claim 2, this claim specifically states that this is a fault-tolerant static timing analysis method. In lines 5-7 of page 19 of the specification, this is explained to mean a timing analysis which determines whether a network can meet timing requirements even in the presence of a bounded number of defects. Belkhale does not address the presence of defects in a network. As explained above, false path analysis does not relate to circuit defects, but instead, to paths which are not sensitizable via any input pattern.

Fifth, regarding claim 4, the false problem to which Belkhale applies is well known to those in the art to be due to different logical sensitization conditions in a timing graph, and this is in no way related to any of manufacturing abnormalities insufficiently serious to cause a hard failure, conductor coupling, or voltage changes in floating components.

III. FORMAL MATTERS AND CONCLUSION

The Office Action objects to Figure 1. The above-described Amendment to the Drawings and attachments thereto amend Figure 1 to label it as prior art.

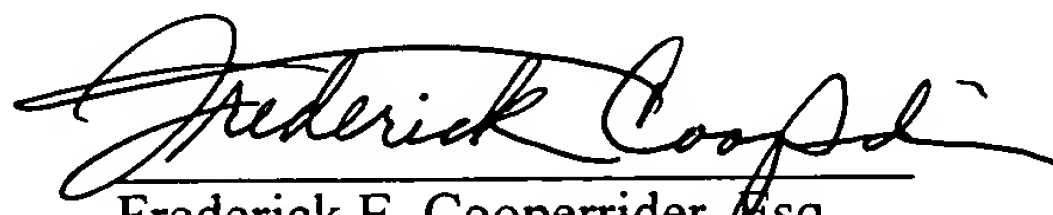
In view of the foregoing, Applicant submits that claims 1-22, all the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 09-0456.

Respectfully Submitted,

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